

FOUR NEW SPECIES OF EUBADIZON NEES FROM  
WESTERN UNITED STATES  
(HYMENOPTERA: BRACONIDAE).

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The species described here belong to that section of the genus *Eubadizon* Nees which comprises parasites of coleopterous larvae and has sometimes been called *Brachistes* Wesmæl or *Calyptus* Haliday, both of which names were treated as synonyms of *Eubadizon* by Muesebeck and Walkley (in Muesebeck *et al.*, 1951, U. S. Dept. Agr., Agr. Monogr. No. 2, p. 112). Recently Martin (1956, Canada Dept. Agr. Publ. 965, p. 9) has redivided *Eubadizon* and has resurrected *Calyptus* in his key to the genera of the subfamily Blacinae. The characters he has used will not separate the two groups, however; and it may, furthermore, be shown that *Eubadizon* of Martin and other authors is not *Eubadizon* Nees. In fact, if the genus is to be redivided it may be necessary to use *Provancheria* Ashmead for the species that are parasitic on Lepidoptera (the group to which Martin would apply the name *Eubadizon*) and to retain *Eubadizon* for the species that parasitize Coleoptera. At any rate it seems best to reserve judgment on the advisability of using *Calyptus* for such species as those treated here until a critical study can be made of the entire *Eubadizon* complex.

Names for the first and second species described below have been requested for use in connection with biological studies, and I am taking this opportunity to describe two additional related species. All are from the West Coast of the United States.

***Eubadizon ernobii* n. sp.**

Superficially like *americanum* (Cresson) but immediately distinguishable by its broader and non-receding temples, by its black hind coxae, and by the presence of a small median tooth on the anterior margin of the clypeus.

*Female*.—Length about 3 to 3.5 mm. Head from above not, or barely, twice as wide as long, smooth and shining; temples not at all receding, wider than eyes; clypeus rugulose, its anterior margin with a very small but distinct median tooth; malar space a little longer than median length of clypeus; ocellocular line at least three times as long as diameter of an ocellus; antennae not quite as long as body, usually 26- to 28-segmented, the segments of apical half

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of flagellum shortened but all still a little longer than broad.

Mesoscutum shining; notaulices sharply impressed but not distinctly foveolate and meeting in a small rugulose area which is crossed by a weak median longitudinal carina; the lobes of mesoscutum faintly punctate; prescutellar furrow long and broad and divided by a median longitudinal septum; disc of scutellum small, convex, smooth; propodeum with two large, quadrate, smooth and shining basal median areas that extend beyond basal third and are separated by a strong median longitudinal carina, the surface laterad and caudad of these areas finely rugulose; side of pronotum entirely rugulose; mesopleuron smooth and shining; metapleuron rugulose; first abscissa of radius at least half as long as intercubitus and subequal to second abscissa of cubitus; nervulus usually post-furcal by nearly its own length; nervellus about equal to lower abscissa of basella.

Abdomen about as long as thorax; first tergite slightly longer than broad, closely longitudinally rugulose except medially toward base where it is smooth, the dorsal keels usually distinct only on basal half of the tergite; second tergite slightly longer than third, finely longitudinally aciculate medially, smooth laterally, broadly so on posterior half; suture between second and third tergites very fine, not punctate; third tergite largely or entirely smooth, but often very finely longitudinally aciculate medially on basal half; the following tergites smooth and polished; ovipositor sheath very slender, longer than the body.

Black; mandibles reddish brown; wings hyaline, stigma and veins brown; tegulae dark brown or blackish; anterior and middle legs brown, their coxae above, their trochanters and the bases of their femora, piceous; hind legs with the coxae black or blackish, the trochanters piceous, the femora brown, the tibiae brown, blackish apically, and the tarsi blackish.

*Male*.—Essentially like the female except that the antennae are a little longer and more slender and the legs are more extensively darkened.

*Type*.—U. S. National Museum No. 63,503.

*Type-locality*.—Green Valley Meadow, Cuyamaca State Park, San Diego County, California.

Described from numerous specimens (one female, holotype) reared by Herbert Ruckes, Jr. in 1956 from larvae of the anobiid genus *Ernobius* in cones of *Pinus jeffreyi* taken at the type locality, and from several additional specimens reared by P. D. Sargent from cones of *Pinus ponderosa* collected at Ashland, Oregon and Sisson, California in 1913.

**Eubadizon definitum** n. sp.

Closely similar to *ernobii*, described above, and sometimes parasitizing the same hosts in cones of the same species of pine. It differs most conspicuously in having the tegulae and all coxae honey-yellow, in the more coarsely and completely striate second tergite, in the deeper and broader suture between the second and third tergites, in the relatively narrower temples, and in the somewhat longer antennae.

*Female*.—Length usually 3.5 to 4 mm. Head from above slightly less than twice as broad as long, smooth and shining; temples barely receding, very nearly as wide as eyes; clypeus rugulose, its anterior margin with a weak tooth at the middle; malar space a little shorter than median length of clypeus or than basal width of mandible; ocellular line a little more than twice as long as greatest diameter of a lateral ocellus; antennae 28- to 35-segmented, usually 32- or 33-segmented, the apical third of flagellum tapering noticeably to apex and some of the segments in this portion as broad as long.

Mesoscutum shining, with numerous very shallow but distinct punctures, some of which are confluent; notaulices strongly impressed, broad and foveolate, and meeting in a small rugulose area behind middle lobe, this area not crossed by a weak median longitudinal carina as it is in *ernobii*; propodeum rugulose except for two large basal areas which are smooth, and which are bounded behind by a strong, somewhat arched, transverse carina; side of pronotum rugulose on lower two-thirds, smooth and polished above; mesopleuron smooth and shining; metapleuron finely rugulose; first abscissa of radius a little more than half as long as intercubitus; nervulus usually postfurcal by about half its length; nervellus subequal with lower abscissa of basella.

Abdomen not longer than thorax; first tergite closely longitudinally rugulose striate except for a small basal median area which is smooth, the convergent dorsal keels often obliterated beyond middle; second tergite nearly or quite twice as broad as long, completely longitudinally striate; suture between second and third tergites sharply impressed, deeper and broader than in *ernobii*; third tergite a little shorter than second, longitudinally aciculate at least medially and sometimes largely, smooth and shining along the sides and posteriorly; ovipositor sheath a little longer than the body.

Black; scape brownish beneath toward base; palpi pale; wings hyaline, stigma and veins brown; tegulae yellow; legs, including all coxae, honey-yellow, the hind tibiae and the middle and hind tarsi more or less infuscated.

*Male*.—Essentially like the female, but the antennae are more slender and do not taper so noticeably, and even the shortest flagellar segments are much longer than broad.

*Type*.—U. S. National Museum No. 63,504.

*Type-locality*.—Frederick, Oregon.

Described from numerous specimens of both sexes reared from coleopterous larvae in the cones of *Pinus ponderosa*, *P. lambertiana*, *P. jeffreyi* and *P. monophylla* collected at various localities in Oregon and California. The holotype female and several paratypes are labeled as having been reared from *Conophthorus ponderosae* Hopkins at Frederick, Oregon, January 26, 1915, by P. D. Sergeant. Other paratypes have been reared by Herbert Ruckes, Jr. in 1956 from species of *Ernobius* in the cones of *Pinus lambertiana* taken in Plumas County, California, and in those of *P. jeffreyi* collected in San Diego County, California.

#### **Eubadizon electum** n. sp.

This suggests *strigitergum* (Cushman), another western species, but it may be distinguished readily by its much shorter malar space, the weaker and shorter dorsal keels of the first tergite and its longer ovipositor. In *strigitergum* the malar space is nearly half as long as an eye, the dorsal keels of the first tergite are usually complete and the ovipositor sheath is not longer than the abdomen.

*Female*.—Length about 5 mm. Head from above not quite twice as wide as long; face more than twice as wide as high, rugulose immediately below antennal foramina, otherwise finely punctate and shining; clypeus nearly three-fourths as long as wide, rugulose, its anterior margin slightly sinuate but without a median tooth; malar space shorter than clypeus or than basal width of mandible and less than one-third the eye height; temples convex, not receding, very nearly as wide as eyes; ocellular line about two and one-half times as long as diameter of an ocellus; antennae a little shorter than body, tapering slightly to apices, a few of the preapical segments only very little longer than broad.

Mesoscutum finely punctate, shining; notaulices deep but narrow and finely foveolate, meeting behind in a small rugulose area; prescutellar furrow divided into several foveae by prominent longitudinal septa; disc of scutellum with scattered, weak punctures; propodeum closely rugulose, except for two small, smooth and shining areas at base; side of pronotum smooth and shining above the longitudinal impression, rugulose below it, the impression itself crossed by numerous strong rugae; mesopleuron smooth and shin-



ing; metapleuron rugulose; hind coxae smooth; first abscissa of radius fully two-thirds as long as intercubitus and longer than second abscissa of cubitus; nervulus very slightly postfurcal; nervellus a little longer than lower abscissa of basella.

Abdomen about as long as thorax; first tergite finely and closely longitudinally rugulose and subopaque, smooth and shining only medially toward base between the dorsal keels, which are weak and fade out near middle of tergite; second tergite longitudinally rugulose aciculate, not distinctly longer than third, the suture between them very fine but sharp and distinct; third and following tergites smooth and polished; ovipositor sheath about as long as thorax and abdomen combined.

Black; clypeus, mandibles and scape and pedicel beneath, reddish or brownish yellow; tegulae and wing bases yellow; stigma and veins largely brown; legs, including all coxae, entirely yellow.

*Male*.—Essentially like the female. The only male seen has the antennae 34-segmented.

*Type*.—U. S. National Museum No. 63,505.

*Type-locality*.—Bly, Oregon.

Described from four females (one, holotype) and one male from the type locality, reared from mountain mahogany, *Cercocarpus ledifolius*, by W. J. Buckhorn, October 31, 1931 under Hopkins U. S. No. 18953-B. There is also in the U. S. National Museum a female specimen of the same species, though not included in the type series, which is labeled as having been reared from *Phymatodes* in maple at Placerville, California, in 1916, by F. B. Herbert.

### ***Eubadizon salicicola* n. sp.**

This species most closely resembles *atricornis* (Ashmead), but differs in its much longer ovipositor, its almost interstitial nervulus, and the more completely developed dorsal keels of the first tergite.

*Female*.—Length about 2.5 mm. Head smooth and shining; clypeus more or less rugulose, its anterior margin subtruncate and with no indication of a median tooth; temples gradually receding, a little narrower than the eyes; malar space as long as median length of clypeus; ocellocular line slightly more than twice the diameter of a lateral ocellus; antennae 23- or 24-segmented in the available specimens, a few of the preapical segments barely, or not, longer than broad.

Mesoscutum polished and impunctate; notaulices complete, deeply impressed and rather coarsely foveolate; no rugulose area behind middle lobe; propodeum with two transverse, smooth and polished

areas at base separated by a short median longitudinal carina, remainder of propodeum rugulose reticulate and shining; side of pronotum smooth and polished but with some strong rugae crossing the longitudinal impression; mesopleuron smooth and polished; metapleuron rugose; first abscissa of radius fully half as long as intercubitus; nervulus very nearly, or quite, interstitial.

Abdomen shorter than thorax; first tergite about as broad at apex as long, shiny, longitudinally rugulose laterad of the dorsal keels, smooth between them, the keels prominent and nearly attaining caudal margin of tergite; second and following tergites smooth and polished; suture between second and third tergites very faint; ovipositor sheath about as long as thorax and abdomen combined.

Black; scape and basal segments of antennal flagellum brownish; tegulae yellow; wings hyaline, stigma and veins brown; legs, including all coxae, yellow, the hind tibiae apically and sometimes outwardly, and all the tarsi, infuscated.

*Male*.—Like the female but with antennae longer and more slender, 28-segmented in the type series, tapering apically, the segments of apical third very slender.

*Type*.—U. S. National Museum No. 63,506.

*Type-locality*.—Orville, Butte County, California.

Described from eight females (one, the holotype) and two males reared from larvae of *Dorytomus* sp. (Curculionidae) on willow at the type locality, April 20, 1930, by H. H. Keifer.

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**Snow Scorpionfly in Northern Utah**—Sixty-three adult males and females and at least twenty-six larvae of *Boreus coloradensis* Byers, were recently collected in Cache County, Utah. My wife, Mary, and I collected the first five adults from moss growing on a sizable rock in Spring Hollow of Logan Canyon, October 28, 1956. Later collections in the same area and near the mouth of Blacksmith Fork Canyon, extended the collection period until December 3. Dr. D. W. Davis, W. J. Hanson and Karim Goodarzy joined me on some trips to collect moss while seeking this interesting species.—GEORGE F. KNOWLTON, Logan, Utah.